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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,589	12/31/2003	Hong Jiang	ITL.1710US (P18028)	8821
21906 7590 11/23/2007 TROP PRUNER & HU, PC 1616 S. VOSS ROAD, SUITE 750 HOUSTON, TX 77057-2631			EXAMINER WAI, ERIC CHARLES	
			ART UNIT 2195	PAPER NUMBER
			MAIL DATE 11/23/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/750,589

Applicant(s)

JIANG ET AL.

Examiner

Eric C. Wai

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/31/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/20/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-34 are presented for examination.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-5, 12-13, 19-22, 26-27, and 33-34 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-18 of copending Application No. 10/750,583. Although the conflicting claims are not identical, they are not patentably distinct from each other.

4. For example, claim 1 of copending Application No. 10/750,583 recites placing a thread in an inactive state in response to a predetermined condition and sending a

message from a semaphore to change the state of the thread. Claim 1 of the present application performs the substantially the same steps. Claim 1 of the present application differs only in that the threads are intended to be used to process graphical elements of an image. However, it would have been obvious to one of ordinary skill in the art to include processing a graphical image. One would be motivated by the desire to extend the scope of the claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The following terms are not clearly understood:

i. Claim 20 recites, "at least one additional execution circuit to execute threads of instructions". It is unclear how the additional execution circuit is related to the rest of the invention (i.e. what is the purpose of the additional execution circuit?).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwok et al. (US Pat No. 5,951,672 hereinafter Kwok), in view of Wenniger (US Pat No. 6,018,785).

9. Kwok was disclosed on IDS dated 04/20/2006.

10. Regarding claim 1, Kwok teaches a method comprising:

executing a first thread of instructions to process a first graphical element of an image to be displayed; executing a second thread of instructions to process a second graphical element of the image to be displayed (Fig 5, wherein a main thread handles graphics work A and a child thread handles graphic works B);

placing the first thread of instructions in an inactive state in response to detection of at least one of a set of predetermined conditions related to a relationship between the first graphical element and the second graphical element (col 4 lines 35-44, wherein the first thread is in a waiting state after testing variables linking the two threads);

maintaining the first thread of instructions in the inactive state according to a semaphore entity (col 4 lines 35-44, wherein the thread remains in a waiting state when the variables indicate that the task is not complete); and

resuming execution of the first thread of instructions in response to the semaphore entity (col 4 lines 35-44, wherein the task is executed).

11. Kwok does not explicitly teach that a message is received from the semaphore entity. However, Wenniger teaches using an active semaphore to generate an interrupt signal whenever a semaphore status changes (col 6 lines 1-22). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kwok to use an 'active' semaphore. One would be motivated by the desire to reduce unnecessary resource usage caused by continuous polling of passive semaphores as indicated by Wenniger (col 6 lines 10-12).

12. Regarding claim 2, Kwok teaches that the set of predetermined conditions comprises an unresolved dependency (col 3 line 64 to col 4 line 11, wherein there is an unresolved dependence on the work buffer).

13. Regarding claim 3, Wenniger teaches that the set of predetermined conditions comprises the lack of a response from the semaphore indicating that a resource corresponding to the semaphore is unavailable (col 6 lines 12-16, wherein process B must wait for receipt of the interrupt).

14. Regarding claim 4, Kwok teaches maintaining an indication of a state for the first thread of instructions and for the second thread of instructions (col 4 lines 1-11, wherein state variables for each thread are consulted).

15. Regarding claim 5, Kwok teaches that the indication of the state of each thread comprises a state variable corresponding to a dependency, if any, of an associated thread (col 4 lines 1-11, wherein state variables for each thread are consulted).

16. Regarding claim 6, Kwok does not explicitly teach that the first thread comprises a first set of ray tracing instructions and the first graphical element comprises a first ray segment, and further wherein the second thread comprises a second set of ray tracing instructions and the second graphical element comprises a second ray segment.

17. However, Kwok teaches that lighting and illumination are a crucial part of graphics processing (col 7 lines 31-48). It would have been obvious to one of ordinary skill at the time of the invention that the first thread comprises a first set of ray tracing instructions and the first graphical element comprises a first ray segment, and the second thread comprises a second set of ray tracing instructions and the second graphical element comprises a second ray segment since processing such graphical elements are commonly done by processors processing graphics..

18. Regarding claim 7-8, Kwok and Wenniger do not teach that the first thread comprises a first set of video decoding instructions and the first graphical element

comprises a first picture segment comprising a first macroblock, and further wherein the second thread comprises a second set of video decoding instructions and the second graphical element comprises a second picture segment comprising a second macroblock.

19. It would have been obvious to one of ordinary skill in the art at the time of the invention to include that the first and second thread process a set of video decoding instructions and graphical elements comprising macroblocks. One would be motivated by the desire to extend the scope of Kwok and Wenniger to video decoding.

20. Regarding claim 9, Kwok does not explicitly teach that the first thread comprises a first set of three-dimensional rendering instructions and the first graphical element comprises a first render primitive, and further wherein the second thread comprises a second set of three-dimensional rendering instructions and the second graphical element comprises a second render primitive.

21. Kwok does teach that the processor must process three-dimensional primitives (col 5 lines 12-19). It would have been obvious to one of ordinary skill at the time of the invention that the first thread comprises a first set of three-dimensional rendering instructions and the first graphical element comprises a first render primitive, and further wherein the second thread comprises a second set of three-dimensional rendering instructions and the second graphical element comprises a second render primitive since processing such graphical elements are commonly done by processors processing graphics.

22. Regarding claim 10, Kwok does not explicitly teach that the first render primitive comprises one of a first point, a first line, a first triangle, and a first triangle strip, and further wherein the second render primitive comprises one of a second point, a second line, a second triangle, and a second triangle strip.

23. Kwok does teach that primitives are triangles defined by three vertices (col 5 lines 21-21). It would have been obvious to one of ordinary skill at the time of the invention that primitives comprise one of a point, a line, a triangle, and a triangle strip.

24. Regarding claim 11, Kwok does not explicitly teach the steps of
determining a distance value for the first render primitive;
determining a distance value for the second render primitive;
comparing the distance value for the first render primitive and the second render primitive to determine a relationship between the first render primitive and the second render primitive; and
displaying a selected one of the first render primitive and the second render primitive based on the relationship between the first render primitive and the second render primitive.

25. However, Kwok does teach that transformation and clipping operations must be performed on the graphics data using a coordinate system (col 6 lines 53-67). It would have been obvious to one of ordinary skill at the time of the invention to perform transformation and clipping operations since they are part of the graphics pipeline.

26. Regarding claims 12-18, they are the apparatus claims of claims 1, and 6-10 above. Therefore, they are rejected for the same reasons as claims 1, and 6-10 above.

27. Regarding claim 19, Kwok teaches further comprising a memory coupled with the execution circuitry to store the first thread of instructions and the second thread of instructions (wherein it is inherent that memory is used to store the instructions).

28. Regarding claim 20, Kwok and Wenniger do not explicitly teach further comprising: at least one additional execution circuit to execute threads of instructions; and a thread dispatcher coupled with the execution circuitry and at least one additional execution circuit to dispatch threads for execution.

29. It would have been obvious to one of ordinary skill in the art, at the time of the invention to add one additional execution circuit to execute threads of instructions and a thread dispatcher. It is well known in the art to add additional execution units to increase processing capability of processors.

30. Regarding claim 21, Wenniger teaches that when the first thread of instructions is in the inactive state, execution of the instructions ceases and the execution circuitry does not poll the semaphore entity to determine a status of the semaphore request message (col 5 lines 12-16, wherein Process B awaits receipts of an interrupt from the semaphore).

31. Regarding claims 22-25, they are the apparatus claims of claims 1, and 6-9 above. Therefore, they are rejected for the same reasons as claims 1, and 6-9 above.

32. Regarding claims 26-34, they are the system claims of claims 1, 6-10, 19, and 21 above. Therefore, they are rejected for the same reasons as claims 1, 6-10, 19, and 21 above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric C. Wai whose telephone number is 571-270-1012. The examiner can normally be reached on Mon-Thurs, 9am-5pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng - Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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EW



MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100